

Serial No. 09/987,404
Docket No. SH-0027US

7

REMARKS

Applicants concurrently file herewith a Petition for Extension of Time for a one (1) month extension of time, and corresponding extension of time fee.

Claims 1, 3-8, 10-15, and 17 are all of the claims presently pending in the application. Claims 1, 8 and 15 have been amended to more particularly define the invention.

Entry of this Amendment is believed proper since no new issues are being presented to the Examiner that would require further consideration and/or search.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1 and 3-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishikawa et al. (U.S. Patent No. 6,116,055) (hereinafter "Ishikawa"). Claims 8, 10-15 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishikawa in view of Antos et al. (U.S. Patent No. 6,289,698) (hereinafter "Antos").

These rejections are respectfully traversed in the following discussion.

Serial No. 09/987,404
Docket No. SH-0027US

8

I. THE CLAIMED INVENTION

The claimed invention of exemplary claim 1, provides a method for sintering a porous glass-material having a core inside the porous-glass material, wherein the predetermined range of <the outer diameter(d) of the porous-glass material includes substantially $0.5 \times D < d < 0.9 \times D$ (e.g., see Application at page 9, line 24 through page 10, line 31). This feature is important for ensuring uniform vitrification in the radial direction of the porous-glass material (see Application at page 9, lines 30-33).

II. THE PRIOR ART REFERENCES

A. The Ishikawa Reference

The Examiner alleges that the claimed invention of claims 1 and 3-7 would have been obvious in view of Ishikawa. Applicants submit, however, that there are elements of the claimed invention which are neither taught nor suggested by, nor would have been obvious in view of, Ishikawa.

That is, Ishikawa does not teach or suggest a method for sintering a porous glass-material having a core inside the porous-glass material, wherein "*said predetermined range of said outer diameter (d) of said porous-glass material comprises substantially $0.5 \times D < d < 0.9 \times D$* " as recited in claim 1, and similarly recited in claims 8 and 15.

Indeed, the Examiner does not even allege that Ishikawa teaches or suggests these features.

The Examiner merely maintains that Ishikawa teaches a ratio of d/D of 0.93. The Examiner argues that 0.93 teaches the claimed range of $0.5 \times D \leq d \leq 0.9 \times D$, because 0.93 written to one significant digit is 0.9.

Serial No. 09/987,404
Docket No. SH-0027US

9

However, as explained in the Statement of Substance of the Interview filed on October 24, 2005, the Examiner indicated, during the personal interview conducted on September 22, 2005, that amending the claimed invention to recite a range between 0.5 and 0.9 (i.e., $0.5 \times D < d < 0.9 \times D$), would exclude 0.93.

The Examiner further argued, however, that although 0.93 is not included in the claim range of $0.5 \times D < d < 0.9 \times D$, that the claimed range would have been obvious in view of Ishikawa, absent a showing of criticality of the claimed range. Applicants respectfully disagree.

That is, to establish a *prima facie* case of obviousness of a claimed range, the Examiner must show that the claimed ranges “overlap or lie inside ranges disclosed by the prior art” or the inventor has merely discovered “the optimum or workable ranges by routine experimentation” (see M.P.E.P. § 2144.05). The Examiner has not even alleged either of these requirements. Therefore, Applicants submit that the Examiner has clearly failed to establish a *prima facie* case of obviousness.

Thus, it is not necessary for Applicants to show criticality to overcome the Examiner’s rejection based on Ishikawa, because the Examiner has not established a *prima facie* case of obviousness. Therefore, it is not necessary for Applicants to provide rebuttal evidence.

However, even assuming, *arguendo*, that the Examiner has established a *prima facie* case of obviousness, Applicants provide the following evidence and test data to demonstrate the importance (and unexpected superior results) of the claimed range (Applicants submit the following test data prepared by the inventors in the Research and Development Division of Shin-Etsu Chemical Co., Ltd.).

Serial No. 09/987,404
Docket No. SH-0027US

10

A porous-glass material having an outer diameter d mm, shown in the table below, and a length of 3000 mm was vitrified using the sintering apparatus (shown in Figure 1 of the present application) in the same method indicated in the Examples of the specification (e.g., see Application at pages 13-16). In performing the test, 50 test pieces (porous-glass material) were used in tests numbers 1-4. The test results are provided in the following table.

Test No.	d (mm)	D (mm)	D/D	Number of test pieces of which surface was not damaged.	Number of test pieces of which surface was damaged.	Number of test pieces caused damage to the furnace.
1	350	400	0.88	50	0	0
2	360	400	0.90	50	0	0
3	370	400	0.93	34	16	0
4	380	400	0.95	0	50	3

In the cases where $d/D < 0.9$ (tests numbers 1 and 2), the surface of the porous-glass material is not damaged even though the porous-glass material rotates and swings to one specific direction in a furnace. This is because a porous-glass material does not contact with a sidewall of the furnace since there is sufficient space between the porous-glass material and the sidewall of the furnace. As shown in the table above, none of the 50 pieces had surfaces that were damaged.

Serial No. 09/987,404
Docket No. SH-0027US

11

In the cases where $d/D > 0.9$ (test numbers 3 and 4), a lower part of the surface of a porous-glass material is damaged when the porous-glass material rotates and swings to one specific direction in the furnace. This is because a lower part of the porous-glass material of which a side is not held by a rotation mechanism of the furnace contacts with a sidewall of the furnace, since there is not sufficient space between the porous-glass material and the sidewall of the furnace.

As shown in the table above, in the case where $d/D = 0.93$ (test number 3, which is the same ratio of d/D as is disclosed in Ishikawa), 16 test pieces out of 50 resulted in asperity of the surface of the porous-glass material, which was caused by peeling of the surface of the porous-glass material and a broken piece of the damaged portion of the furnace becoming adhered to the surface of the porous-glass material.

Additionally, in the case where $d/D = 0.95$ (test number 4), all of the 50 test pieces resulted in the same drawback as that of test number 3. Furthermore, in executing the test, the furnace was broken three times by contacting a porous-glass test piece.

Therefore, Applicants respectfully submit that the range recited in claim 1 (and similarly recited in claims 8 and 15) is clearly important and has not been arbitrarily selected as alleged by the Examiner and indeed has provided unexpectedly superior results over the closest prior art of record.

Therefore, Applicants submit that the claimed invention recites features that are not obvious in view of Ishikawa. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

Serial No. 09/987,404
Docket No. SH-0027US

12

B. The Antos Reference

The Examiner alleges that Antos would have been combined with Ishikawa to form the claimed invention of claims 8, 10-15 and 17. Applicants submit, however, that even if combined, the alleged combination of references would not teach or suggest each and every feature of the claimed invention.

That is, neither Ishikawa nor Antos, nor any combination thereof, teaches or suggests that "*said predetermined range of said outer diameter (d) of said porous-glass material comprises substantially $0.5xD < d < 0.9xD$* " as recited in claim 1 and similarly recited in claims 8 and 15.

As detailed in section A, above, Ishikawa does not teach or suggest this feature. Furthermore, Applicants respectfully submit that Antos fails to make up the deficiencies of Ishikawa.

The Examiner attempts to rely on column 4, lines 5-34 of Antos to support his allegations.

Nowhere, however, in this passage (nor anywhere else for that matter) does Antos teach or suggest a method for sintering a porous glass-material having a core inside the porous-glass material, wherein the predetermined range of <the outer diameter(d) of the porous-glass material includes substantially $0.5xD < d < 0.9xD$. Indeed, the Examiner does not even allege that Antos teaches or suggests this feature. The Examiner merely relies upon Antos as teaching that it is known to stretch preforms to reduce bubbles.

Thus, Antos clearly fails to make up for the deficiencies of Ishikawa.

Serial No. 09/987,404
Docket No. SH-0027US

13

Therefore, Applicants respectfully submit that even if combined, the alleged combination of features does not teach or suggest each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

IV. FORMAL MATTERS AND CONCLUSION

In response to the Examiner's objections to the claims, Applicants note that claims 4 and 6 were previously amended to replace the term "determined" with the term "predetermined" (see Amendment filed on July 27, 2005). Therefore, as agreed upon in the personal interview conducted on September 22, 2005, the Examiner's objection is clearly erroneous. The Examiner is respectfully requested to withdraw this objection.

On November 7, 2005 the Examiner issued an Advisory Action in response to a "reply" filed on October 24, 2005. The Examiner indicated that the "reply" failed to place the Application in condition for allowance. Applicants respectfully submit that the Advisory Action was clearly issued in error.

That is, a "reply" to the Office Action was not filed on October 24, 2005. On October 24, 2005 Applicants merely filed a Statement of Substance of the Interview (as was clearly indicated on the first page of the paper). The Statement was not a response to the Office Action, but, as indicated in the Statement, was merely a summary of the interview conducted on September 22, 2005.

In view of the foregoing, Applicants submit that claims 1, 3-8, 10-15 and 17, all of the claims presently pending in the application, are patentably distinct over the prior

Serial No. 09/987,404
Docket No. SH-0027US

14

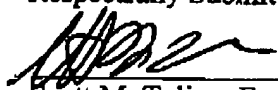
art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: January 26, 2006



Scott M. Tulino, Esq.
Reg. No. 48, 317

Sean M. McGinn, Esq.
Reg. No. 34, 386

**MCGINN INTELLECTUAL PROPERTY
LAW GROUP, PLLC**
8321 Old Courthouse Road, Suite 200
Vienna, VA 22182-3817
(703) 761-4100
Customer No. 21254

Serial No. 09/987,404
Docket No. SH-0027US


15

FACSIMILE TRANSMISSION

I hereby certify that I am filing this paper via facsimile, to Group Art Unit 1731, at
(571) 273-8300, on January 26, 2006.

Date: January 26, 2006

Respectfully submitted,



Scott M. Tulino, Esq.
Reg. No. 48,317

Sean M. McGinn, Esq.
Reg. No. 34,386